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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,226	11/14/2003	Myung Kwan Ryu	CU-3454 RJS	2538
26530	7590	04/25/2006	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604			NGUYEN, THANH T	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/714,226

Applicant(s)

RYU ET AL.

Examiner

Thanh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-10 is/are rejected.
- 7) ☒ Claim(s) 2-4 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

In view of the argument filed on 2/17/06, the election/restriction has been withdrawn.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al.

(U.S. Patent No. 6,326,286).

Referring to figures 13-26, Park et al. teaches a method for fabricating single crystal silicon film comprising:

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forming a single crystal region through a laser irradiation after forming a semiconductor layer or a metal thin film on a transparent or semi-transparent substrate (see col. 7, lines 6+) which comprises the steps of:

Forming a single crystal seed region on the substrate of the desired size by a crystallization method using laser irradiation (see col. 9, lines 16+), the step of forming a single crystal seed region being comprised of steps of (see col. 9, lines 16+);

Irradiating the substrate in a first direction using a first laser scanning process (see col. 9, lines 16-43);

After the first laser scanning process is complete, irradiating the substrate in a second direction substantially orthogonal to the first direction (see col. 9, lines 16-43).

Regarding to claim 5, the single crystal region is formed over the entire substrate, or a portion where a semiconductor device is formed, or a portion where a circuit region of the semiconductor device is formed (see col. 9, lines 16+).

Regarding to claim 6, the transparent substrate (1) includes glass, plastic and insulating film (see col. 14, lines 46-48).

Regarding to claim 7, the insulating film (3) is a Si nitride or oxide film selected from  $\text{SiO}_x$ ,  $\text{SiO}_x\text{H}_y$ ,  $\text{SiN}_x$ , and their bilayer or multiple layer, or a film of nitride or oxide of a metal selected from Al, Cu, Ti and W (see col. 14, lines 46-48).

Regarding to claim 8, the semiconductor layer is made of one selected from a-Si, a-Ge,  $\text{a-Si}_x\text{Ge}_y$ , poly-Si, poly-Ge, and poly- $\text{Si}_x\text{Ge}_x$  (see abstract).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (U.S. Patent No. 6,326,286) as applied to claims 1, 5-8 above, in view of Sato (U.S. Patent No. 5,304,357).

Referring to figures 13-26, Park et al. teaches a method for fabricating single crystal silicon film comprising:

forming a single crystal region through a laser irradiation after forming a semiconductor layer on a transparent or semi-transparent substrate (see col. 7, lines 6+) which comprises the steps of:

Forming a single crystal seed region on the substrate of the desired size by a crystallization method using laser irradiation, the step of forming a single crystal seed region being comprised of steps of (see col. 9, lines 16+);

Irradiating the substrate in a first direction using a first laser scanning process (see col. 9, lines 16-43);

After the first laser scanning process is complete, irradiating the substrate in a second direction substantially orthogonal to the first direction (see col. 9, lines 16-43).

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Regarding to claim 5, the single crystal region is formed over the entire substrate, or a portion where a semiconductor device is formed, or a portion where a circuit region of the semiconductor device is formed (see col. 9, lines 16+).

Regarding to claim 6, the transparent substrate (1) includes glass, plastic and insulating film (see col. 14, lines 46-48).

Regarding to claim 7, the insulating film (3) is a Si nitride or oxide film selected from SiO<sub>x</sub>, SiO<sub>x</sub>H<sub>y</sub>, SiN<sub>x</sub>, and their bilayer or multiple layer, or a film of nitride or oxide of a metal selected from Al, Cu, Ti and W (see col. 14, lines 46-48).

Regarding to claim 8, the semiconductor layer is made of one selected from a-Si, a-Ge, a-Si<sub>1-x</sub>Ge<sub>x</sub>, poly-Si, poly-Ge, and poly-Si<sub>1-x</sub>Ge<sub>x</sub> (see abstract).

However, the reference does not teach the metal thin film is made of a metal selected from Al, Cu, Ti, W, Au and Ag, or a compound of the metal and a semiconductor and irradiate the substrate by using excimer laser.

Sato et al. teaches forming the metal thin film is made of a metal selected from Al, Cu, Ti, W, Au and Ag, or a compound of the metal and a semiconductor (see col. 7, lines 24-63) and irradiate the substrate by using excimer laser (see col. 8, lines 46-50).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would use excimer laser and also forming a metal thin film instead of semiconductor layer in process of Park et al. as taught by Sato et al. because it is known in the art to use excimer laser to irradiate the beam to the substrate. It is also known in the art to form a metal thin film to provide a layer with more conductivity.

*Allowable Subject Matter*

Claims 2-4, 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art teaches or suggests the subset of teach irradiating the substrate of the desired size with a laser in a specific shape through a mask so that the laser-irradiated portion is firstly crystallized, conducting a first scanning process which comprises moving the laser by the desired distance so that a grain in the firstly crystallized portion is grown by the desired distance, completing the first scanning process after it was progressed by the desired distance, thereby forming a poly-crystal island region, conducting a second scanning process which comprises 90° turning the laser at the end of the first scanning process and scanning the seed grain formed in an elongated shape in the scanning direction during the first scanning process so that the seed grain is grown to form a single crystal region, irradiating the laser onto a portion of a single crystal seed region formed after progressing the second scanning process by the desired distance, thereby extending the single crystal region.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (**See MPEP 203.08**).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR



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system, see <http://pairdirect.uspto.gov>. Should you have questions on access to thy Private PAIR system, contact the Electronic Business center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thanh', with a stylized flourish extending from the end.

Thanh Nguyen  
Patent Examiner  
Patent Examining Group 2800

TTN